MAX–PLANCK–INSTITUT FÜR AERONOMIE
D–37191 Katlenburg-Lindau, Federal Republic of Germany

The `preprint` Collection of LaTeX Packages

Patrick W. Daly

1998/07/16

Abstract

A number of LaTeX packages have been developed to adapt the `article` class more to the formats generally used in this house. They may be called individually, or all together as a *document class* named `preprint`.

Overview

I have developed a LaTeX document class for use in the Max-Planck-Institut für Aeronomie, conforming more to the geophysical standards that we normally use in comparison to the LaTeX standard `article` class. It may be called by replacing `article` with `preprint` in the `\documentclass` command:

```
\documentclass[...options...]{preprint}
```

It also functions properly in the compatibility mode of LaTeX 2_ε (i.e., emulating version 2.09).

This class changes the sectioning and layout formats of the standard `article` class. A number of other packages belonging to my `preprint` collection may also be invoked. With the option `full`, all of them will be loaded automatically.

These constituent packages are:

`fullpage` to set the page margins such that there is one inch on all four sides.

`mpaehead` to put a MPAe heading and logo on the first page of the article; for MPAe reports, the report number may be added as part of the title information.

`authblk` to allow author/affiliation blocks or affiliation by footnote; is loaded automatically with `mpaehead`.

`appendix` to make the equations, figures, and tables be numbered within appendices.

`balance` to balance the two columns on the last page when `twocolumn` has been selected.

`sublabel` allows selected elements to be sub-numbered, such as equations in the sequence 4, 5a, 5b, 6, ... Figures and tables may also be so numbered.

`figcaps` puts the list of figure captions at the end automatically, along with all the tables from the article; the `figure` and `table` environments appear in the source text where they are first referred to, but the figure captions and the tables appear at the end; optionally, the figures themselves appear at the very end. Why do it this way? It is how a manuscript is normally prepared for submission. Then, by turning off this option, a preprint may be produced with the figures and tables in the text where they belong, without making any other change to the source text.

`natbib` produces literature references from a `thebibliography` environment or from a BibTeX data base in the style of JGR: [*Gold and Stevens*, 1990] instead of the LaTeX standard of [1]; for BibTeX, a number of bibliographic style files (`.bst`) are available for emulate the styles of JGR, Astronomy and Astrophysics, Planetary and Space Science, Cospar, Nature, and ESA publications.

All of the above may be used with other main classes, like the standard `article`, either together or singly. (However, `figcaps` must be called after `appendix` and `sublabel`.)

A number of other options exist that may be used only with the `preprint` class.

`full` loads all of the above packages.

`ms` makes a manuscript by adding a title page, double spacing, and activates the figure captions list, by reading in `figcaps` even if `full` has not been issued.

`draft` is the same as `ms`, but this conflicts with the `graphicx` package; kept for compatibility.

`nosecnum` suppresses section numbering.

The following options are provided for consistency with other packages but really do not do anything.

`a4` is superfluous since the layout is designed for A4 paper.

`a4in` is equally superfluous.

`secnum` is the opposite of `nosecnum`, but is the default anyway.

The regular LaTeX options `twoside`, `twocolumn`, and `titlepage` may also be given.

Implementing the Packages

Any document that has been prepared for the LaTeX `article` class may add them with the `\usepackage` command, e.g.:

```
\documentclass{article}
\usepackage{mpaehead,appendix}
```

Any number of packages may be included, in any order, except that `sublabel` and `appendix` must come before `figcaps`.

Implementing the Whole Preprint Package

Alternatively, the complete preprint format may be invoked with

`\documentclass[full,`*... options...*`]{preprint}` for a preprint, or
`\documentclass[ms,full,`*... options...*`]{preprint}` for a manuscript.

This not only loads most of all the packages, but also changes the sectioning and layout formats, as well as the form of running headlines and some other things. Naturally, the normal LaTeX options such as `11pt`, `12pt`, `titlepage`, etc. may also be included.

Some of the packages are only loaded in conjunction with some others. For example:

`balance` only makes sense when the standard option `twocolumn` has also been given, so it is only read in with `twocolumn`;

`figcaps` is appropriate only for a manuscript, which is indicated with the option `ms`; by leaving off the `ms` option, a preprint is produced instead of a manuscript.

How to Use the Extra Features

Some of these features, such as `appendix`, work automatically without any extra interaction from the user, while others, such as `sublabel`, only enable new commands that the user must know how to employ. These new commands are listed here organized according to the package that defines them.

Extra `preprint` Features

`\iftwocol{`*yes*`}{`*no*`}` allows one to enter alternative text depending on whether `twocolumn` has been selected or not. This is sometimes necessary with formulas that do not fit into the narrow column of a two-column page. The *yes* text is entered if `twocolumn` is active, otherwise the *no* text is included.

`\begin{plate}...\end{plate}` is an environment that functions exactly the same as `figure`, but with independent numbering. A starred version also exists for double-column plates in `twocolumn` mode. This environment has been added because JGR wants coloured figures to be labelled as "plates" instead of "figures".

`\listofplates` is analogous to `\listoffigures` for printing out the list of plates.

Extra `fullpage` Features

This package can only be used in conjunction with a page size specification in the `\documentclass` command, such as `a4paper`, which is given automatically by the `preprint` class. See the list of loading options below for additional features.

Extra `mpaehead` Features

`\reportno{`*mpae report number*`}` allows one to enter an internal report identification number that is then printed at the top of the first page; Fr. Kohl distributes these numbers. If this command is missing, then no number is printed.

Extra `authblk` Features

(This package is loaded automatically with `mpaehead`. It may be loaded independently, without that package.)

In standard LaTeX, one enters authors and affiliations with a single `\author{..\and..\and..}` command, as

```
\author{J. B. Smith\\Institute for Research
  \and
       F. G. James and K. Baldwin\\NASA}
```

This produces

J. B. Smith
Institute for Research

F. G. James and K. Baldwin
NASA

With this package, one can additionally enter them as

```
\author{J. B. Smith} \affil{Institute for Research}
\author{F. G. James} \author{K. Baldwin} \affil{NASA}
```

For one or two affiliations, this produces the same result as the first example, but for more, a footnote style is automatically generated. This would look like

J. B. Smith[1], F. G. James[2], and K. Baldwin[2]

[1]*Insitute of Research*
[2]*NASA*

(This is only illustrative; it really takes three or more affiliations to produce this style.)

Furthermore, each of the `\author` and `\affil` commands may be given an explicit footnote marker, as an optional argument. This is useful to force footnotes even for two affiliations, and if the authors are not ordered by affiliation.

```
\author[1]{K. Baldwin}
\author[2]{J. B. Smith}
\author[1]{F. G. James}
\affil[1]{NASA}
\affil[2]{Institute for Research}
```

produces

K. Baldwin[1], J. B. Smith[2], and F. G. James[1]

[1]*NASA*
[2]*Insitute of Research*

Extra `appendix` Features

None.

Extra balance Features

\balance turns the column-balancing feature on. It is advisable to print out the two-column document first without balancing; then add \balance somewhere within the text of the first column. After the next processing, the two columns will be (nearly) the same length. Theoretically, one could activate \balance earlier, but my experience is that sometimes extra lines of text are written below figures and tables. My balancing act is not perfect, so use it only where it is needed.

\nobalance turns off balancing if it was already on.

Extra sublabel Features

\sublabon{*counter*}...\sublaboff{*counter* } turn sublabelling on and off for the specified counter. Any existing counter name may be given, but the most meaningful ones are equation, table, figure, and plate. Sublabelling means that the main counter stays unchanged and a suffix is added to it, usually a lowercase letter. Equations may then have a sequence of 4, 5*a*, 5*b*, 6,.... These commands function *globally*, i.e., they are not affected by the range of other environments.

If \sublabon is issued again while sublabelling of that counter is still active, then the main counter is incremented and the sub-counter reset. Thus

```
\sublabon{x} ... \sublabon{x} ... \sublaboff{x}
```

is the same as

```
\sublabon{x} ... \sublaboff{x}\sublabon{x} ... \sublaboff{x}
```

\substyle determines the form of the sublabels. The default within sublabel.sty is lowercase italic letters, as shown above. However, this may be changed by redefining \substyle. The preprint style contains such a redefinition, and makes the above sequence to be 4, 5-a, 5-b, 6,.... This is done with

```
\renewcommand{\substyle}[1]{-\alph{#1}}
```

The user may make similar redefinitions if he wishes.

Extra figcaps Features

When figcaps has been invoked, either explicitly or under preprint with the option ms, then the figures, tables, and plates are not printed where they have been entered in the source text, but are collected throughout the whole paper and printed at the end. This is the usual place for them in a manuscript. However, by changing the options in the \documentclass command to produce a preprint in one or two columns, they will appear in the text as they should, without the user having to move them about.

Actually, only the figure and plate captions are listed at the end, along with the tables. There is an option to allow the figures and plates to be output as well, but this only makes sense if the figure and plate environments contain something that LaTeX can print.

Often figures are produced outside of LaTeX and are simply added to the manuscript by hand. Or, space is left in the text where they are later glued in. In this case, one should reserve the space with a \vspace command. For example,

```
\begin{figure}
  \vspace{5cm}
  \caption{....}
\end{figure}
```

For a manuscript, the `\vspace` command is simply ignored, but when a preprint is printed, a blank space 5 cm high will be reserved for the figure.

Alternatively, figures may be produced with LaTeX in `picture` environment, or may be imported as encapsulated PostScript files. As an example of the latter, suppose the figure is stored in a (PostScript) file named `myfig.eps`. It is imported with

```
\begin{figure}
 \includegraphics[height=5cm]{myfig.eps}
  \caption{...}
\end{figure}
```

(This requires the package `graphicx` to have been loaded with `\usepackage`.) In this case, the figure is imported into the preprint, but only the figure caption is listed in the manuscript.

The special command `\printfigures` given *before* `\begin{document}` will cause the figures (and plates) to be output even for manuscripts, at the very end of the document.

Extra `natbib` Features

One of the reasons that BibTeX is not so popular in this Institute is that it produces numerical literature citations instead of the author-year system that we normally use. I have written bibliographic style files for the following journals to get around this problem:

Name of style	For publications in:
`agu`	JGR, GRL
`aa`	Astronomy and Astrophysics
`anngeo`	Annales Geophysicæ
`pass`	Planetary and Space Science
`nlinproc`	Nonlinear Processes in Geophysics
`cospar`	Advances in Space Research
`esa`	ESA
`nature`	Nature

Only the first five of these are of the author-year style, the rest being numerical. These names may be used are arguments to the `\bibliographystyle` command to specify the desired style.

However, the style files alone do not solve the author-year problem. There are two ways to refer to a paper in this style,

> ... as has been shown by Smith *et al.* [1992] ...
> ... it has been shown [Smith *et al.*, 1992] that ...

My `natbib` package allows both of these forms to be generated with the `\citet` and `\citep` commands. Let us suppose that the above reference exists in some BibTeX database named `mylit.bib` with the key `smith92`. Then the above two statements may be produced, in AGU style, with

```
... as has been shown by \citet{smith92} ...
... it has been shown \citep{smith92} that ...
. . . . . .
\bibliographystyle{agu}
\bibliography{mylit}
```

An optional argument may be given in square brackets for text that is printed *after* the reference, such as `page 22` or `chap. 2`, as in standard LaTeX. A second set of square brackets may be given with text, in which case the first text comes *before*, the second *after* the citation. This is my invention, and is not standard LaTeX.

Loading Options

Under LaTeX 2_ε, packages may have their own options which are included in the `\usepackage` command, as

`\usepackage[`*options*`]{`*package*`}`

If the `full` option is given for `preprint`, then it is not necessary to load the other packages with `\usepackage`. In any event, with or without `full`, any of the package options may then be added to the class options in the `\documentclass` line.

Options for `fullpage`

`in` (default) sets a one inch margin all around the text and headings and footers;

`cm` sets a margin of 1.5 cm all around;

`plain` (default) sets `\pagestyle{plain}` and removes the space reserved for the headings;

`empty, headings, myheadings` set corresponding page styles and take them into account when fixing the margins.

This package requires that the correct paper specification (e.g., `a4paper`) be given in `\documentclass`. The `preprint` class automatically selects `a4paper` and loads `fullpage` with options `cm, myheadings`.

Options for `mpaehead`

None.

Options for `authblk`

`blocks` automatic selection will always be author/affiliation blocks;

`noblocks` automatic selection will always be footnote mode;

`max`n ($n = 2, 6$) there are n affiliations before switching to footnote style

`auth-sc` sets author font to small caps;

`auth-sc-lg` sets author font to small caps, but with size `\large`;

`auth-lg` sets author font to normal, but in size `\large`;

`affil-sl` sets affiliation font to slanted;

`affil-it` sets affiliation font to italic;

`german` changes 'and' to 'und' in author lists.

Options for `appendix`

`mylang` (default) keeps the current value for the word 'Appendix';

`english, american` sets 'Appendix' unconditionally to English;

`german, austrian, french, esperanto` translates to the given language;

`blank` suppresses the printing of the appendix title with the `\appendix` command.

Options for `balance`

None.

Options for `sublabel`

`italic` to have subnumbers as italic lowercase letters (default);

`roman` to have the subnumbers as Roman lowercase letters, as 4a.

(Actually, `preprint` itself overwrites these definitions, so these options are ineffectual.)

Options for `figcaps`

The same language options as for `appendix`, plus

`figon` (default) activates the whole procedure of moving figures and tables to the back of the article, (same as `\figcapson`);

`figoff` deactivates the whole procedure, (same as `\figcapsoff`);

`printfigures` allows the figures themselves and not just their captions to be output at the very end, in addition to the caption page, (same as `\printfigures`); by default this is not done;

`figmark` enables marking of figure and table environments in the text with marginal notes; (same as `\figmarkon`);

(Again, `preprint` sets many of these itself.)

Options for `natbib`

`round` (default) for round parentheses;

`square` for square brackets;

`colon` (default) to separate multiple citations with colons;

`comma` to use commas as separaters;

`authoryear` (default) for author-year citations;

`numbers` for numerical citations;

`super` for superscripted numerical citations, as in *Nature*;

`nobibstyle` to ignore punctuation style specified by `\bibliographystyle`.

Summary of Extra Commands

This is an alphabetically-ordered quick-reference of the extra or modified commands mentioned above.

`\author[`*mark*`]{`*author_name*`}` enters the name of a single author, with optional footnote marker *mark*. Must be given for each author separately.

`\affil[`*mark*`]{`*affiliation_text*`}` enters text for the affiliation of the previous `\author`(s), with optional footnote marker *mark*. Must be given once for each affiliation.

`\balance` turns on the column balancing when `twocolumn` has been selected.

`\begin{plate}...\end{plate}` is an environment exactly like `figure` meant for coloured plates.

`\bibliographystyle{`*style*`}` may take on arguments `agu`, `anngeo`, `pass`, `cospar`, `esa`, `nature`, as well as the standard `plain`.

`\citet{`*ref_key*`}` prints the reference as author [year] for `agu` style, or author (year) for `pass`, `anngeo`, `nlinproc`, or `aa` styles, otherwise it prints a running number formatted as for the selected journal.

`\citep{`*ref_key*`}` prints the reference as [author, year] for `agu` style, or (author, year) for `pass`, `anngeo`, `nlinproc`, or `aa` styles, otherwise it prints a running number formatted as for the selected journal.

`\citep[`*post*`]{`*ref_key*`}` prints the reference as [author, year, *post*] or (author, year, *post*), i.e., with a note after the reference, as in standard LaTeX.

`\citep[`*pre*`] [`*post*`]{`*ref_key*`}` prints the reference as [*pre* author, year, *post*] or (*pre* author, year, *post*), i.e., with notes before and after the reference; this is non-standard LaTeX.

`\citeauthor{`*ref_key*`}` prints the authors of given reference, without the year.

`\citeyear{`*ref_key*`}` prints the year of given reference, without the authors.

`\iftwocol{`*yes*`}{`*no*`}` includes text *yes* if `twocolumn` has been selected, otherwise text *no*.

`\figcapsoff` de-activates the macros that put the figure captions and tables at the end of the article, so that the environments work as normal.

`\figcapson` activates the macros to put the figure captions and tables at the end of the article.

`\figmarkoff` suppresses the appearance of marginal notes where figure, table plate should come.

`\figmarkon` allows marginal notes to appear where the figure, table, plate should apper in the text.

`\listofplates` prints a list of plates, analogous to `\listoffigures`.

`\nobalance` de-activates column balancing.

`\printfigures` (only in the preamble, before `\begin{document}`) will add the actual figures and plates at the end of a manuscript; otherwise, only the captions are listed at the end.

`\reportno{`*mpae report number*`}` includes an MPAe report number at the top of the first page.

`\sublabon{`*counter*`}...\sublaboff{`*counter*`}` causes *counter* to be sublabelled.

`\substyle` may be redefined to change the style of the sublabels.